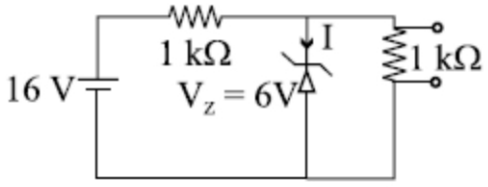
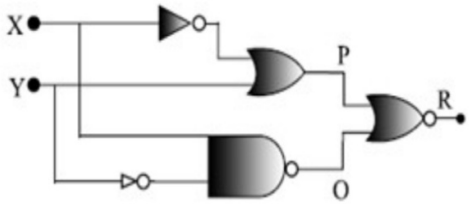
NTA NEET MOCK GRAND TEST - 15

PHYSICS

1. A current $I = 20\sin(100\pi t)$ A is passed in the first coil, which induces a maximum emf of $10\pi V$ in the second coil. The mutual inductance for the pair of coils is
   1) 10 mH 2) 15 mH 3) 25 mH 4) 5 mH
2. A uniform magnetic field exists in a region given by $\vec{B} = 3\hat{i} + 4\hat{j} + 5\hat{k}$ T. A rod of length 5m is placed along the y – axis and it is moved along the x-axis with constant speed $1ms^{-1}$. The induced e.m.f. in the rod will be
   1) zero 2) 25V 3) 20V 4) 15V
3. A transformer is used to light 140W, 24V lamp from 240 V ac mains. The current in the main cable is 0.7 A. The efficiency of the transformer is
   1) 63.8% 2) 84% 3) 83.3% 4) 48%
4. The current in an LCR circuit is given by $I = 20\sin\left(100\pi t + \frac{\pi}{3}\right)A$. The voltage across the inductance L of 0.1 H at t = 0 will be
   1) 31.4V 2) 3.14V 3) 157V 4) 314V
5. The time required for a 50 Hz alternating current to increase from 0 to 70.7% of its peak value is
   1) 2.5ms 2) 10ms 3) 20ms 4) 14.14ms
6. The focal length of a simple convex lens used as a magnifier is 10cm. For the image to be formed at a distance of distinct vision D = 25cm, the object must be placed away from the lens nearly at a distance of
   1) 5cm 2) 7cm 3) 8cm 4) 16cm
7. In Young's experiment, the ratio of maximum and minimum intensities in the fringe system is 9:1. The ratio of amplitudes of coherent sources is
   1) 9:1 2) 3:1 3) 2:1 4) 1:1
8. The plane surface of a plano – convex lens of focal length F is silvered. It will behave as
   1) Plane mirror
   2) convex mirror of focal length 2F
   3) concave mirror of focal length $\frac{F}{2}$
   4) none of these
9. What is value of current I in given circuit



   1) 6 mA 2) 10 mA 3) 4 mA 4) zero
10. The figure gives a system of logic gates. From the study of the truth table, it can be found that to produce a high output (1) at R, we must have



   1) $X = 0, Y = 1$ 2) $X = 1, Y = 1$ 3) $X = 1, Y = 0$ 4) $X = 0, Y = 0$

11. An electron is in an excited state in a hydrogen – like atom. It has a total energy of -3.4 eV. The kinetic energy of the electron is E and de Broglie wavelength is λ

1) $E = 6.8eV, \lambda \sim 6.6\times10^{-10}m$

2) $E = 3.4eV, \lambda \sim 6.6\times10^{-10}m$

3) $E = 3.4eV, \lambda \sim 6.6\times10^{-11}m$

4) $E = 6.8eV, \lambda \sim 6.6\times10^{-11}m$

12. The energy levels in an atom A, B and C are in increasing order $E_A < E_B < E_C$. The x – rays emitted in transitions $C \to B, B \to A \, and \, C \to A$, have wavelengths $\lambda_1, \lambda_2 \, and \, \lambda_3$ then which of the following relation is true?

1) $\lambda_3 = \lambda_1 + \lambda_2$ 2) $\lambda_3 = \dfrac{\lambda_1\lambda_2}{\lambda_1 + \lambda_2}$ 3) $\lambda_1 + \lambda_2 + \lambda_3 = 0$ 4) none

13. If the over – bridge is concave instead of being convex, the thrust on the road at the lowest position will be

1) $mg + \dfrac{mv^2}{r}$ 2) $mg - \dfrac{mv^2}{r}$ 3) $\dfrac{m^2v^2g}{r}$ 4) $\dfrac{v^2g}{r}$

14. A particle is moving with a constant speed along a straight line path. A force is not required to

1) Increase its speed 2) decrease the momentum

2) change the direction 4) keep it moving with uniform velocity

15. Which of the following statements is not true

1) the coefficient friction between two surface increases as the surface in contact are made rough

2) the force of friction acts in a direction opposite to the applied force

3) rolling friction is greater than sliding friction

4) the coefficient of friction between wood and wood is less than 1

16. If $\vec{A} = 4\hat{i} - 3\hat{j}$ and $\vec{B} = 6\hat{i} + 8\hat{j}$ then magnitude and direction of $\vec{A} + \vec{B}$ will be

1) $5, \tan^{-1}\left(\dfrac{3}{4}\right)$ 2) $5\sqrt{5}, \tan^{-1}\left(\dfrac{1}{2}\right)$ 3) $10, \tan^{-1}(5)$ 4) $25, \tan^{-1}\left(\dfrac{3}{4}\right)$

17. The random error in the arithmetic mean of 100 observations is x; then the random error in the arithmetic mean of 400 observations would be

1) $4x$ 2) $\dfrac{x}{4}$ 3) $2x$ 4) $\dfrac{x}{2}$

18. 50g ice at $0\,^0C$ in kept in an insulating vessel and 50g water at $100\,^0C$ is mixed in it. Then the final temperature of the mixture is (neglect the heat loss)

1) $10\,^0C$ 2) $0\,^0C < Tm < 20\,^0C$ 3) $20\,^0C$ 4) above $20\,^0C$

19. Direction of energy in the spectrum of a black body can be correctly represented by

1) wien's law 2) stefan's law 3) planck's law 4) kirchhoff's law

20. Air is a bad conductor of heat or partly conducts heat, still, the vaccum is to be placed between the walls of the thermos flask because

1) It is difficult to fill the air between the walls of thermos flask

2) due to more pressure of air, the thermos can get crack

3) by convection, heat can flow through air

4) on filling the air, there is no advantage

21. Water enters through end A with speed v_1 and leaves through end B with speed v_2 of a cylindrical tube AB. The tube is always completely filled with water. In case I, the tube is horizontal and in case II, it is vertical with end A upwards and in case III, it is vertical with end B upwards. We have $v_1 = v_2$ for

1) case I 2) case II 3) case III 4) each case

22. If a bullet of mass 5g moving with velocity $100\,ms^{-1}$, penetrates the wooden block up to 6 cm. then the average force imposed by the bullet on the block is

1) 8300 N 2) 417 N 3) 830 N 4) zero

23. A constant pressure air thermometer gave a reading of 47.5 units of volume when immersed in ice cold water and 67 units in a boiling liquid. The boiling point of the liquid will be
1) 135^0C 2) 125^0C 3) 112^0C 4) 100^0C

24. When vapour condenses into liquid
1) it absorbs heat 2) It liberates heat
3) Its temperature increases 4) Its temperature decreases

25. A travelling wave passes a point of observation. At this point, the time interval between successive crests is 0.2 s and
1) the wavelength is 5m 2) the frequency is 5 Hz
3) the velocity of propagation is 5m/s 4) the wavelength is 0.2m

26. A tuning fork makes 256 vibrations per second in air. When the velocity of sound is 330 m/s, then wavelength of the tone emitted is
1) 0.56m 2) 0.89m 3) 1.11m 4) 1.29m

27. A particle executes a simple harmonic motion of time period T. Find the time taken by the particle to go directly from its mean position to half the amplitude.
1) $\frac{T}{2}$ 2) $\frac{T}{4}$ 3) $\frac{T}{8}$ 4) $\frac{T}{12}$

28. The lengths of two rods made up of the same metal and having the same area of cross – section are 0.6 m and 0.8 m respectively. The temperatures between the ends of first rod are 90^0C *and* 60^0C and that for the other rod are 150^0C *and* 110^0C respectively. For which rod the rate of conduction will be greater.
1) first 2) second 3) same for both 4) none of the above

29. In a thermodynamic process. 200J of heat is given to a gas and 100 J of work is also done on it. The change in internal energy of the gas is
1) 100J 2) 300J 3) 419J 4) 24J

30. A perfect gas at 27^0C is heated at constant pressure so as to triple its volume. The temperature of the gas will be
1) 81^0C 2) 900^0C 3) 627^0C 4) 450^0C

31. When a copper ball is heated, the largest percentage increase will occur in its
1) diameter 2) area 3) volume 4) density

32. For a particle of a purely rotating body, $v = r\omega$, so correct relation will be
1) $\omega \propto \frac{1}{r}$ 2) $\omega \propto v$ 3) $v \propto \frac{1}{r}$ 4) ω is independent of r

33. Two rings of same radius 'r' and mass 'm' are placed such that their centres are at a common point and their planes are perpendicular to each other. The moment of inertia of the system about an axis passing through the centre and perpendicular to plane of one of the rings is
1) $\frac{1}{2}mr^2$ 2) mr^2 3) $\frac{3}{2}mr^2$ 4) $2mr^2$

34. In a one dimensional collision of two particles, velocities are interchanges when:
i) Collision is elastic and masses are equal
ii) Collision is inelastic but masses are unequal
select the correct alternative
AAJ KA TOPPER
1) only (i) is correct 2) only (ii) is correct
3) Both (i) and (ii) are correct 4) both (i) and (ii) are wrong

35. A projectile is fired with velocity v_0 at an angle 60^0 with horizontal. At top of its trajectory it explodes into three fragments of equal masses. First fragment retraces the path, second moves vertically upwards with speed $\frac{3v_0}{2}$. Speed of the third fragment is
1) $\frac{3v_0}{2}$ 2) $\frac{5v_0}{2}$ 3) v_0 4) $2v_0$

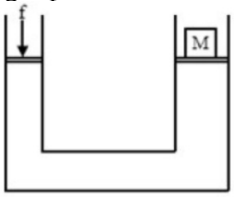
36. A boy and a man carry a uniform rod of length L horizontally in such a way that the boy gets $\left(\frac{1}{4}\right)^{th}$ of the load. If the boy is at one end of the rod, the distance of the man from the other end is

1) $\frac{L}{3}$ 2) $\frac{L}{4}$ 3) $\frac{2L}{3}$ 4) $\frac{3L}{4}$

37. A body constrained to move in the 'y' direction is subjected to a force given by $\vec{F}=\left(-2\hat{i}+15\hat{j}+6\hat{k}\right)N$. What is the work done by this force in moving the body through a distance 10m along the y axis?

1) 20J 2) 150J 3) 160J 4) 190J

38. In a hydraulic press, radii of connecting pipes, r_1 *and* r_2 are in the ratio 1:2 in order to lift a heavy mass M on the larger piston, the small piston must be pressed through a minimum force 'f' equal to



1) Mg 2) $\frac{Mg}{2}$ 3) $\frac{Mg}{4}$ 4) $\frac{Mg}{8}$

39. Liquids A and B are at 30^0C and 20^0C respectively. When mixed in equal masses, the temperature of the mixture is found to be 26^0C. Their specific heats are in the ratio of

1) 3:2 2) 1:1 3) 2:3 4) 4:3

40. If a stone is to hit at a point which is at a horizontal distance 100m away and at a height 50m above the point from where the stone starts, then what is the value of initial speed 'u' if the stone is launched at an angle 45^0?

1) $10\sqrt{2}\,m/s$ 2) $10\sqrt{5}\,m/s$ 3) $20\sqrt{5}\,m/s$ 4) $20\sqrt{10}\,m/s$

41. A uniform solid sphere of mass M and radius R is placed on a smooth horizontal surface. It is given a horizontal impulse J at a height h above the centre of mass and sphere starts rolling. Then the value of 'h' and speed of centre of mass are

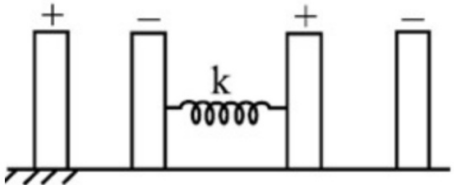
1) $h=\frac{2}{5}R$ *and* $v=\frac{J}{M}$ 2) $h=\frac{2}{5}R$ *and* $v=\frac{2}{5}\frac{J}{M}$

3) $h=\frac{7}{5}R$ *and* $v=\frac{7}{5}\frac{J}{M}$ AAJ KA TOPPER 4) $h=\frac{7}{5}R$ *and* $v=\frac{J}{M}$

42. A body is displaced from $(0m,0m)$ to $(1m,1m)$ along the path $x=y$ by a force $\vec{F}=\left(x^2\hat{j}+y\hat{i}\right)N$. The work done by this force will be

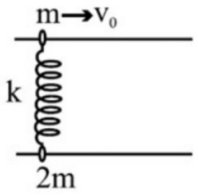
1) $\frac{4}{3}J$ 2) $\frac{5}{6}J$ 3) $\frac{3}{2}J$ 4) $\frac{7}{5}J$

43. Two charged capacitors have their outer plates fixed and inner plates connected by a spring of force constant k. the magnitude of charge on each capacitor is q and sign of charge is shown in figure. Find the extension in the spring at equilibrium.



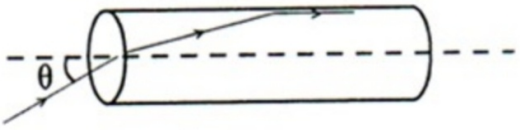
1) $\frac{q^2}{2A\varepsilon_0 k}$ 2) $\frac{q^2}{4A\varepsilon_0 k}$ 3) $\frac{q^2}{A\varepsilon_0 k}$ 4) zero

44. Two rings of mass 'm' and '2m' are connected with a massless spring and can slip over two frictionless parallel horizontal rails having separation equal to the unstretched length of the spring as shown in figure. Ring of mass 'm' is given velocity v_0 in the direction shown. Maximum length by which the spring will be stretched is



1) $\sqrt{\frac{m}{k}}v_0$ 2) $\sqrt{\frac{3m}{k}}v_0$ 3) $\sqrt{\frac{2m}{3k}}v_0$ 4) $\sqrt{\frac{2m}{k}}v_0$

45. A transparent solid cylindrical rod has a refractive index of $\frac{2}{\sqrt{3}}$. It is surrounded by air. A light ray is incident at the midpoint of one end of the rod as shown in the figure. the incident angle θ for which the light ray grazes along the wall of the rod is



1) $\sin^{-1}\left(\frac{1}{2}\right)$ 2) $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$ 3) $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$ 4) $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$

CHEMSITRY

46.

$$\text{Phenol} \xrightarrow[\text{(ii) } CO_2]{\text{(i) NaOH}} (A) \xrightarrow{H^+/H_2O} (B) \xrightarrow{Ac_2O} (C)$$

In this reaction, identify the incorrect statement?
1) A is formed through Kolbe reaction
2) B is salicyclic acid
3) C is O – acetoxybenzoic acid
4) C is a paracetamol

47. An ambidentate ligand is one which –
1) is linked to the metal atom at two points
2) has two donor atoms but only one of them has the capacity to form a coordinate bond
3) has two donor atoms but either of the two can form a co – ordinate bond
4) forms chelate rings

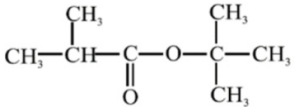
48. A gas undergoes change from state A to state B. In this process, the heat absorbed and work done by the gas is 5J and 8J , respectively. Now gas is brought back to A by another process during which 3J of heat is evolved. In this reverse process of B to A:
1) 6J of the work will be done by the gas
2) 6J of the work will be done by the surrounding on gas
3) 10J of the work will be done by the surrounding on gas
4) 10J of the work will be done by the gas

49. If the nitrogen atom had electronic configuration $1s^7$ it would have energy lower than that of the normal ground state configuration $1s^2 2s^2 2p^3$ because the electrons would be closer to the nucleus. Yet $1s^7$ is not observed. It violates
1) Heisenberg's uncertainty principle
2) Hund's rule
3) Pauli exclusion principle
4) Bohr postulate of stationary orbits

50. What is the minimum pH required to prevent the precipitation of ZnS in a solution that is 0.01m $ZnCl_2$ and saturated with $0.10M\ H_2S$? [Given $K_{SP}=10^{-21}, K_{a_1}\times K_{a_2}=10^{-20}$]

1) 0 2) 1 3) 2 4) 4

51.



The common name of given ester is –

1) neo butyl iso butyrate 2) t – butyl n – butyrate
3) t – butyl iso butyrate 4) iso butyl iso butyrate

52. At 3000K, the equilibrium partial pressure of $CO_2, CO\ and\ O_2$ are 0.6, 0.4 and 0.2 atm respectively. K_p for the reaction, $2CO_2 \rightleftharpoons 2CO + O_2$ is

1) 0.088 2) 0.0533 3) 0.133 4) 0.177

53. Using electrolytic method, the cost of production of 5L of oxygen at STP, is Rs X, the cost of production of same volume of hydrogen at STP, will be

1) 2X 2) $\frac{X}{2}$ 3) 8X 4) $\frac{X}{8}$

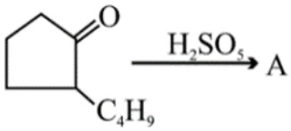
54. The maximum percentage of available volume that can be filled in a face centered cubic system by an atom is

1) 74% 2) 68% 3) 34% 4) 26%

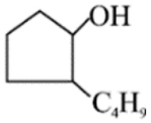
55. A certain current liberated 0.504g of hydrogen in 2h. How many grams of copper can be liberated by the same current flowing for the same time in a copper sulphate solution? Given atomic mass of Cu = 63.5

1) 12.9g 2) 15.9g 3) 31.7g 4) 36.9g

56. Identify the product A in the following reaction:



1)



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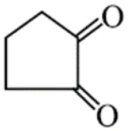
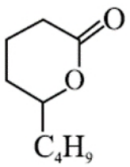
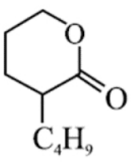


3)



4)

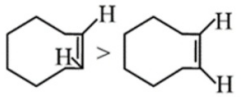


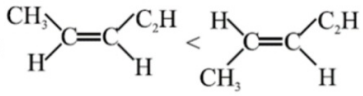
57. The role of fluorspar during the electrolysis of molten alumina is
i) To reduce the melting point
ii) To increase conductivity
iii) As a seeding agent
1) All are correct 2) only (i) is correct 3) (i), (ii) are correct 4) (i), (iii) are correct

58. The reaction $2SO_2(g)+O_2(g)\rightleftarrows 2SO_3(g)$ is carried out in a $1dm^3$ vessel and $2dm^3$ vessel separately. The ratio of the reaction velocities will be
1) 1:8 2) 1:4 3) 4:1 4) 8:1

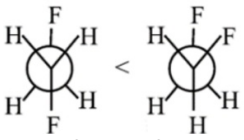
59. Fluorine has low electron affinity than chlorine because of
1) bigger radius of fluorine, less electron density
2) smaller radius of fluorine, high electron density
3) smaller radius oflorine, high electron density
4) smaller radius of chlorine, less electron density

60. What is incorrect order of stability?

(I) 

(II) 

(III) Boat form of $1,4-$ cyclohexandiol $>$ Chairformof1,4 $-$ cyclohexandiol

(IV) 

(V) Gauche form of succinic acid > Anti from of succinic acid
1) I, II, V 2) I, III, IV 3) I, IV 4) I

61. Match the following

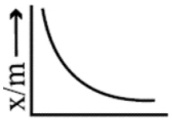
	List – I (Ion)		List – II (Shapes)
(p)	Cassiterite	(1)	$FeCO_3$
(q)	Rutile	(2)	$2Fe_2O_3.3H_2O$
(r)	Cerussite	(3)	SnO_2
(s)	Siderite	(4)	$2CuCO_3.Cu(OH)_2$
(t)	Limonite	(5)	$PbCO_3$
		(6)	TiO_2

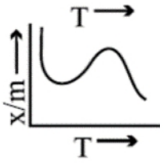
1) (p) – 6; (q) – 3; (r) - 5; (s) – 4; (t) – 2
2) (p) – 1; (q) – 3; (r) – 4; (s) – 2; (t) – 6
3) (p) – 3; (q) – 6; (r) – 5; (s) – 1: (t) – 2
4) (p) – 3; (q) – 6; (r) – 4; (s) – 1; (t) – 5

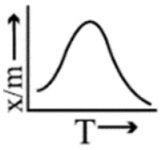
62. Fool's gold is :
1) FeS_2 2) $ZnCl_2$ 3) $CuFeS_2$ 4) Cu_2S

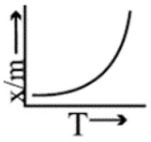
63. Which of the following statements is invalid :
1) The more stable the carbocation the faster it is formed
2) Propyl cation changes to more stable isopropyl carbocation by 1,2 shift of a hydrogen
3) Isopropyl chloride reacts with sodium ethoxide to form 1 – ethoxypropane
4) Propyl halides reacts with sodium ethoxide to form 1 – ethoxypropane

64. Which of the following graph represents the variation of amount of chemisorption of a gas by a solid with temperature under constant pressure?

1) 

2) 

3) 

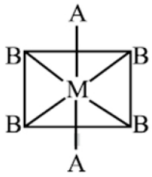
4) 

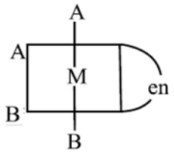
65. $Na_2B_4O_7.10H_2O$ is correctly represented by

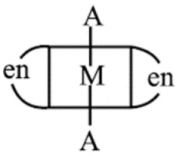
1) $Na_2\left[B_4O_5(OH)_4\right].8H_2O$ 2) $2NaBO_2.Na_2B_2O_3.10H_2O$

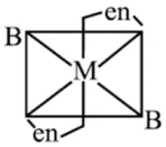
3) $Na_2\left[B_4(H_2O)_4O_7\right].6H_2O$ 4) all of the above

66. The phenomenon of optical activity will be shown by :

1) 

2) 

3) 

4) 

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67. The cylinder contains 100gm of an ideal gas (mol. wt. = 40 gm/mol) at 27^0C and 2atm. pressure. In transportation the cylinder fell and a dent was created. The valve present cannot keep the pressure greater than 2atm. Hence 10 gm of a gas got leaked out. The volume of the container before and after dent is :

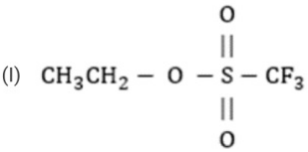
1) 30.8L ; 27.7L 2) 27.7L; 30.8L 3) 30.8L; 30.8L 4) 27.7L; 27.7L

68. Which of the following constitutes a set of amphoteric species:

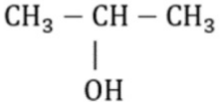
1) $H_3O^+, H_2PO_4^-, HCO_3^-$ 2) $H_2O; HPO_4^{2-}, H_2PO_2^-$

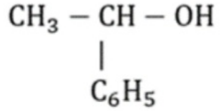
3) $H_2O, H_2PO_4^-, HPO_4^{2-}$ 4) $HC_2O_4^-, H_2PO_4^-, SO_4^{2-}$

69. Arrange decreasing order of reactivity of these compounds for nucleophilic substitution reaction

(I) 

(II) CH_3-CH_2-OTs

(III) 

(IV) 

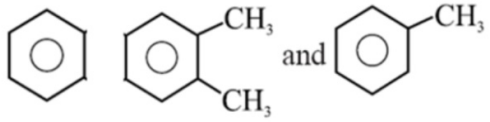
1) III>IV>I>II 2) III>IV>II>I 3) I>II>III>IV 4) I>II>IV>III

70. Ordinary hydrogen at room temperature is a mixture of
1) 75% o – Hydrogen + 25% p – Hydrogen
2) 25% o – Hydrogen + 75% p – Hydrogen
3) 50% o – Hydrogen + 50% p – Hydrogen
4) 1% o – Hydrogen + 99% p – Hydrogen

71. Aqua – regia reacts with Pt to yield –
1) $Pt(NO_3)_4$ 2) H_2PtCl_6 3) $PtCl_4$ 4) $PtCl_2$

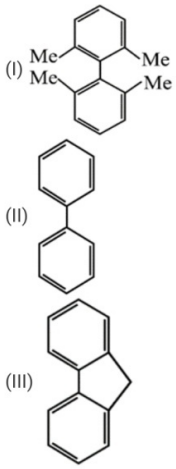
72. Pure H_2S gas can be obtained by the action of water on
1) CuS 2) FeS 3) Flower of sulphur 4) Al_2S_3

73. Number of secondary carbon atoms present in the compounds is respectively:



1) 6,4,5 2) 4,5,6 3) 5,4,6 4) 6,2,1

74. Given all the three compounds. Arrange them in decreasing order of reactivity towards electrophilic aromatic substitution.



1) I>II>III 2) II>I>III 3) III>II>I 4) II>III>I

75. Arrange priority CIP sequence of given groups in decreasing order
i) OH ii) COOH iii) $CHOHCH_3$ iv) CH_2OH
1) I>II>III>IV 2) IV>III>II>I 3) II>III>IV>I 4) IV>I>II>III

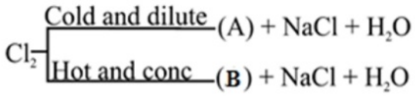
76. In which of the following pairs of molecules/ions, both the species are not likely to exist?
1) H_2^{2+}, He_2 2) H_2^-, He_2^{2+} 3) H_2^+, He_2^{2+} 4) H_2^-, He_2^{2-}

77. What is the product when $C_6H_5-CH_2-NH_2$ reacts with nitrous acid?
1) $C_6H_5-N\equiv N$ 2) $C_6H_5-CH_2-\overset{\oplus}{N}\equiv N$ 3) $C_6H_5-CH_2-OH$ 4) $C_6H_5-NH_2$

78. Which of the following statements is/are not true?
1) Density of solid gets increased due to interstitial defects
2) Frenkel defects do not alter the density of the solid
3) Non – stoichiometric defects modify the formula of the compound
4) Non – stoichiometric defects do not alter the density of the solid

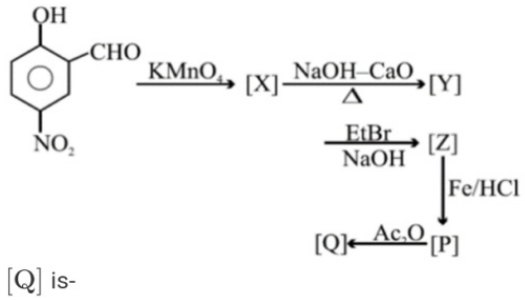
79. Two liquids X and Y form an ideal solution at 300K, vapour pressure of the solution containing 1 mol of X and 3 mol of Y is 550 mmHg. At the same temperature, if 1 mol of Y is further added to this solution, vapour pressure of the solution increases by 10 mmHg. Vapour pressure (in mmHg) of X and Y in their pure states will be, respectively –
1) 300 and 400 2) 400 and 600 3) 500 and 600 4) 200 and 300

80. Compounds (A) and (B) are –



1) $NaClO_3, NaClO$ 2) $NaClO_2, NaOCl$ 3) $NaClO_4, NaOCl_3$ 4) $NaOCl, NaClO_3$

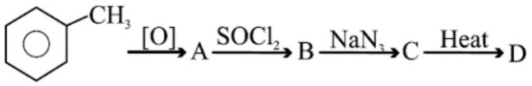
81.



[Q] is-

1) Anisidine 2) Toluidine 3) Benzidine 4) Phenacetin

82. In the following sequence of reaction, what is D?



1) Primary amine 2) An amide
3) Phenyl isocyanate 4) A chain lengthened hydrocarbon

83. An optically active compound 'X' has molecular formula $C_4H_8O_3$. It evolves CO_2 with $NaHCO_3$. 'X' reacts with $LiAlH_4$ to give an achiral compound 'X' is –

1) $CH_3-CH_2-\underset{\displaystyle OH}{\underset{|}{CH}}-COOH$ 2) $CH_3-\underset{\displaystyle Me}{\underset{|}{CH}}-COOH$

3) $CH_3-\underset{\displaystyle CH_2OH}{\underset{|}{CH}}-COOH$ 4) $CH_3-\underset{\displaystyle OH}{\underset{|}{CH}}-CH_2-COOH$

84. Which one of the following regions of atmosphere contains ozone?

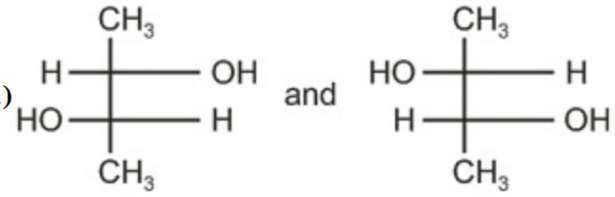
1) Troposphere 2) Thermosphere 3) Mesosphere 4) Stratosphere

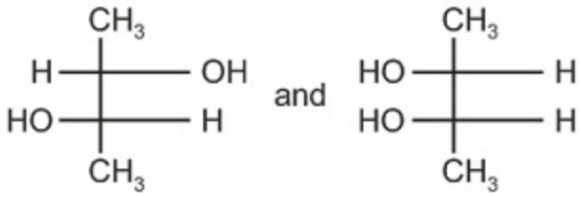
85. Na_2O_2

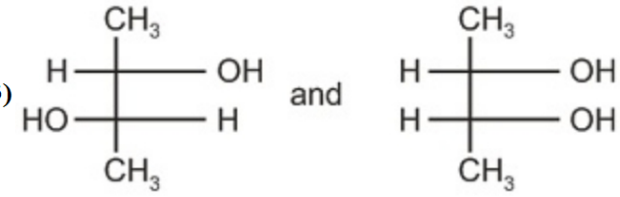
1) Is diamagnetic in nature 2) Is salt of dibasic acid H_2O_2

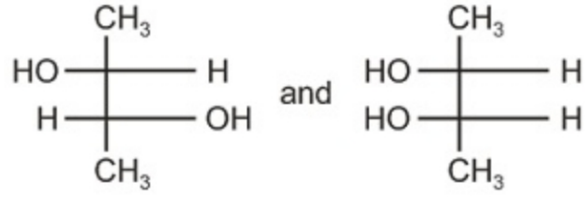
3) Oxidizes Cr^{3+} (green) to CrO_4^{2-} (yellow) 4) All are correct properties of Na_2O_2

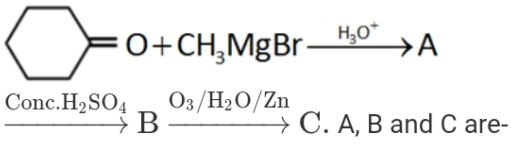
86. Which of the following pairs of compounds are enantiomers?

1)  and

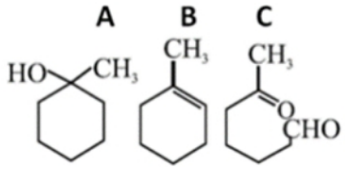
2)  and

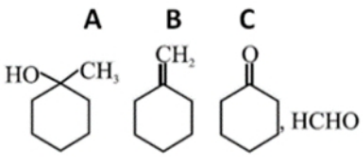
3)  and

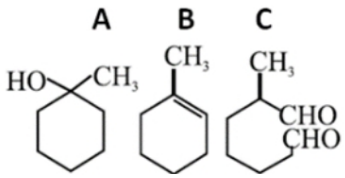
4)  and

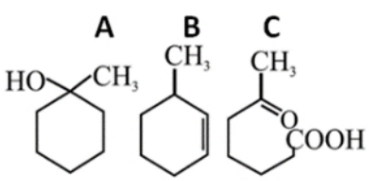
87. 

A, B and C are-

1) 

2) 

3) 

4) 

88. Which one is a biodegradable polymer not polyamide class –
1) Albumin 2) Nylon – 2 –nylon 6 3) PHBV 4) Silk

89. The density of neon will be highest at :
1) STP 2) $0^0C, 2atm$ 3) $270^0C, 1atm$ 4) $0^0C, 1atm$

90. In what order the reagents $Na_2S, NaCl$ *and* NaI are added to an aqueous solution containing Ag^+, Cu^{+2} *and* Ni^{+2} ions in order to precipitate Ag^+ *first*, Cu^{+2} second and Ni^{+2} last
1) $Na_2S, NaI, NaCl$ 2) $NaCl, Na_2S, NaI$ 3) $NaI, NaCl, Na_2S$ 4) $NaCl, NaI, Na_2S$

BIOLOGY

91. In majority of the angiosperms, pollen is released in a two – celled stage. The two cells are
1) the gamete and generative cell
2) the vegetative cell and tube nucleus
3) two male gametes
4) the vegetative cell and generative cell

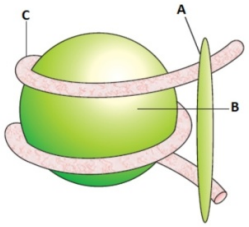
92. Which set of hormones are secreted during pregnancy only?
1) Estogen, hPL, Relaxin 2) progesterone, Cortisol, hCG
3) hCG, hPL, Relaxin 4) Cortisol, Progestogens, Relaxin

93. Which of the following is the correct description of the meachinsm of action of a copper IUD?
1) These inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent or retard entry of sperms.
2) These increase phagocytosis of sperms within the uterus and the certain ions released from it suppress sperm motility and the fertilizing capacity of sperms
3) Ovum and sperms are prevented from physically meeting
4) These prevent coneption by blocking the entry of sperms through the cervix

94. International or voluntary termination of pregnancy before full term is called medical termination of pregnancy (MTP) or induced abortion. Which of the following is incorrect about MTP?
1) MTP has a significant role in decreasing the population
2) Government of India legalized MTP in 1971 with strict conditions to avoid its misuse.
3) MTPs are considered relatively safe during the first trimester in comparison to second trimester abortions.
4) MTP is not allowed if the pregnancy is the result of rape.

95. If the two genes are having % of recombination less than 50%, then the progeny of F_2 generation will show
1) higher number of the recombinant types
2) segregation in the expected 9:3:3:1 ratio
3) segregation in 3:1 ratio
4) higher number of the parental types

96. Identify parts labelled A,B and C in the given diagram and select the correct option



1)

A	B	C
Negatively charged DNA	Positively charged histone octamer	H1 histone

2)

A	B	C
H1 histone	Negatively charged DNA	Positively charged histone octamer

3)

A	B	C
H1 histone	Positively charged histone octamer	Negatively charged DNA

4)

A	B	C
H1 histone	Negatively charged histone octamer	Negatively charged DNA

97. I. Glucose or galactose may bind with the repressor and inactivate it.
II. In the absence of lactose, the repressor binds with the operator region
III. The z – gene codes for permease
IV. The was elucidated by Fracois Jacob and Jacques Monod.
The correct statements are :
1) I and II 2) I and III 3) II and IV 4) I and IV

98. Sometimes the change in allelic frequency is so different in the new sample of the population that they become a different species. The original drifted population create a different population. This is called
1) Founder effect 2) Bottleneck effect 3) metapopulation effect 4) Gene migration

99. How many of the following diseases are transmitted by contaminated food and water?
[Typhoid, Ringworms, Pneumonia, Common cold, Dengue, Amoebiasis, Chikungunya]
1) One 2) Two 3) Three 4) Four

100. Select the incorrect statement from the following
1) Through vaccines, antigenic proteins of pathogen or dead or weakened pathogens are introduced in the body
2) Anti – venom provides active immunity
3) Anti – histamines control allergy 4) Both 1 and 2

101. If the protoplast of tomato is fused with potato protoplast and grown as new plant, it will be known as
1) Explant 2) Somaclones 3) Callus 4) Somatic hybrid

102. Mark the incorrect statement
1) Insect and pest infestation is one of the major causes for large scale destruction of crop plants
2) breeding method for insect pest resistance involves the special steps that are not similar to use in other agronomic traits such as yield or quality .
3) malnutrition of micronutrients and vitamins can be termed as hidden hunger.
4) Somaclones are genetically identical to original plants.

103. Which of the following describes out – crossing?
1) mating of more closely related individuals within the same breed for 4 – 6 generations.
2) This is the practice of mating of animals within the same breed, but having no common ancestors on either side of their pedigree up to 4 – 6 generations.
3) Superior males of one breed are mated with superior females of another breed (of same species).
4) Male and female animals of two different species are mated.

104. Monascus purpureus is a yeast used commercially in the production of
1) Ethanol 2) Streptokinase for removing clots from the blood vessels
3) Citric acid 4) Blood cholesterol lowering statins

105. Which of these is not the feature of a cloning vector?
1) Ori supporting high copy number
2) Selectable marker
3) Resistant to the action of restriction enzymes
4) Presence of cloning site

106. Primers used in PCR must be:
1) 3’ – end specific 2) 5’ – end specific
3) It can be 3’ – end specific or 5’ – end specific
4) primers are not needed in PCR.

107. The variant of cry genes used to control corn borers is
1) crylAc 2) crylAb 3) cryllAb 4) both 1 and 3

108. Which of the following locations acts as the reservoir for nitrogen cycle?
1) Atmosphere 2) Sedimentary bedrock 3) Soil
4) Fossilised plant and animal remains

109. All of the following contributed to Mendels' success, except
1) Mendel's selection of pea plant for experiments
2) Application of mathematical knowledge
3) Working on small sampling size at a time
4) Taking one character at a time

110. Select the incorrect statement
1) A genus comprises of a group of related species which has more characters in common in comparison to species of other genera.
2) higher the category, greater is the difficulty of determining the relationship to other taxa at the same level.
3) Going higher from species to kingdom, the number of common characteristics goes on increasing.
4) All organisms, including plants and the animal kingdom, have species as the lowest category.

111. Which organism does not produce oxygen during photosynthesis?
1) Anabaena 2) Funaria 3) Higher plants 4) Rhodospirillum

112. The smallest among the following is:
1) TMV 2) Bacteriophage 3) Neurospora 4) E. Coli

113. The second –largest phylum of invertebrate animals is:
1) Annelida 2) Aschelminthes 3) Mollusca 4) Platyhelminthes

114. Select the set of incorrect statements
I. The circulatory system in Platyhelminthes has a single opening.
II. Annelids are the first animals to have true coelum and metamerism(true segmentation).
III. The space between the hump and the mantle is called the mantle cavity in which gills are present.
IV. Most of the echinoderms are bisexual.
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1) I, II 2) III, IV 3) II, III 4) I, IV

115. How many of the following shows zygomorphic flowers with valvate/imbricate aestivation?
Indigofera, Lupin, Petunia, Aloe, Colchicum, Autumnale, Sesbania, Trifollum, Solanum
1) 3 2) 4 3) 5 4) 6

116. Annual rings are formed by the activity of
1) Cambium 2) Secondary xylem 3) Phellogen 4) Xylem and phloem

117. How many spermathecae are found in the male cockroach?
1) One 2) One pair 3) 2 Pairs 4) None

118. In *Periplaneta Americana*, the blood vascular system is of ___A____type. Blood vessels are __B__. The visceral organs are located in __C__. __C__ is filled with a fluid which is composed of __D__and __E__.

1)

A	B	C	D	E
Closed	Absent	Enterocoel	Plasma	haemocytes

2)

A	B	C	D	E
Open	Poorly developed	Haemocoel	RBC	Haemolymph

3)

A	B	C	D	E
Open	Absent	Haemocoel	Haemocytes	Lymph

4)

A	B	C	D	E
Open	Poorly developed	Haemocoel	Plasma	Haemocytes

119. The axoneme is found in
1) Cilia 2) Flagella 3) Microbodies 4) Both 1 and 2

120. Statement 1 – Competitive inhibitor is also called as substrate analogue.
Statement 2 – It resembles the enzyme in structure
1) both 1 and 2 are correct 2) 1 is correct and 2 is incorrect
3) 1 is incorrect and 2 is correct 4) both are incorrect

121. Analyze the events occurring during every stage of the cell cycle, how the amount of DNA content (C) per cell changes and select the correct option.
1) DNA content becomes doubled during S phase of cell cycle
2) DNA content is reduced to half during anaphase
3) DNA content remain same during meiosis I
4) Both 1 and 2

122. Which of the following statement is incorrect?
1) Different substances move independently along their concentration gradient in mass flow.
2) Active absorption of ions from the soil by the root is mainly affected by respiratory activity of root.
3) The translocation of organic solutes in sieve tube members is supported by mass flow.
4) Root pressure develops due to active absorption

123. How many protons and electrons are required to fix a dinitrogen?
1) 32 each 2) 8 each 3) 6 each 4) 4 each

124. ATP and $NADPH + H^+$ both are required during the conversion of _____in C_3 cycle
1) $RUBP + CO_2 \rightarrow PGA$ (2 molecules)
2) $PGA \rightarrow PGAL$
3) $PGAL \rightarrow DHAP$
4) Fructose – 1, 3 – biphosphate $\rightarrow$ Glucose

125. In the electron transport chain the correct sequence of electron acceptor is
1) Cytochrome a, a_3, b, c 2) Cytochrome b, c, a, a_3
3) Cytochrome b, c_3, a, a_3 4) Cytochrome c, b, a, a_3

126. Ethylene is highly effective in fruit ripening. It enhance the respiration rate during ripening of fruits, this rise in rate of respiration is called?
1) Respiratory climactic 2) Respiratory quotient
3) Respiratory effect 4) Respiratory quiescence

127. PEM (protein – energy mainutrition) that affects the infants results in
1) marasmus 2) kwashiorkor 3) pot – bellied 4) obesity

128. Moist cuticle is the respiratory organ in
1) Insects 2) Earthworms
3) Aquatic arthropods and mollusks 4) Amphibians like frogs

129. ECG is a graphical representation of the electrical activity of the heart during a cardiac cycle. Identify the incorrect interpretation.
1) P – wave: Depolarisation of the atria.
2) QRS complex : Ventricular systole
3) T – wave : Ventricular repolarisation
4) End of T – wave : End of ventricular systole

130. The amount of urine released by humans in a day is
1) 1 to 1.5 litres of slightly acidic (pH-6.0) urine having 45-60 gm of urea.
2) 1 to 1.5 litres of slightly acidic (pH – 6.0) urine having 25 – 30 gm of urea
3) 0 to 1 litres of slightly alkaline (pH – 7.3) urine having 25-30 gm of urea
4) 1 to 1.5 litres of slightly acidic (pH – 6.0) urine having 45-60 gm of urea.

131. Midbrain is located between
1) Thalamus/hypothalamus of forebrain and pons varolii of hindbrain
2) Thalamus/hypothalamus of forebrain and medulla of hindbrain
3) Olfactory lobe of forebrain and pons varolii of hindbrain
4) Olfactory lobe of forebrain and medulla of hindbrain

132. Thymosins play role in
1) Cell – mediated immunity only
2) Humoral immunity only
3) Both cell – mediated and humoral immunity
4) neither cell – mediated and nor humoral immunity

133. Which set of animals doesn't belong to the same phylum?
1) Roundworm, Hookworm, Filarial worm
2) Earthworm, Leech, nereis
3) Seafan, Sea pen, Brain coral
4) Devil fish, King crab, Chiton

134. Respiratory quotient for tirplamitin is
1) 0.9 2) 0.7 3) 1.0 4) 1.4

135. Periderm includes
1) Cork 2) Cork cambium 3) Secondary cortex 4) All of these

136. Which of the following is correct about phenylketonuria?
1) It is an example of pleiotropy
2) It is an autosomal dominant disease
3) It is caused due to single gene mutation
4) both 1 and 3

137. Two features present in meiosis but absent in mitosis are
1) pairing of non – homologous chromosomes
2) Pairing of homologous chromosomes and recombination between them
3) Replication of chromosome
4) All of these

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138. Which of the following animals have different symmetry in comparison to the other three?
1) Pila 2) Pleurobrachia 3) Sycon 4) Asterias

139. Stomata are not found in
1) Algae 2) Mosses 3) Ferns 4) Liverworts

140. Zygote undergoes cleavage while moving through the isthmus of the oviduct towards the uterus and forms daughter cells called balstomeres. The embryo with 8 to 16 balstomeres is called a __A__which continues to divide to form __B__in uterus. The balstomeres in the __B__are arranged into an outer layer called __C__ and an inner group of cells called the inner cell mass.

1)

A	B	C
Morula	Blastocyst	Haemocytoblast

2)

A	B	C
Morula	Gastrula	Haemocytoblast

3)

A	B	C
Blastula	Gastrula	Trophoblast

4)

A	B	C
Morula	Blastocyst	Trophoblast

141. Mycoplasmas, the smallest cells, are only (i) μm in length while bacteria could be (ii) μm. Among multicellular organisms, human red blood cells are about (iii) μm in diameter. Identify (i), (ii), and (iii).

1)

(i)	(ii)	(iii)
0.5	5-7	7

2)

(i)	(ii)	(iii)
0.3	3-7	9

3)

(i)	(ii)	(iii)
0.3	3-5	4

4)

(i)	(ii)	(iii)
0.3	3-5	7

142. The cellulose cell wall is observed in members of
1) Protista 2) Plantae 3) both 1 and 2 4) Monera

143. Read the following statements:
i) Open type circulatory systems are found in Arthropods
ii) pseudocoelomates are bilaterally symmetrical
iii) Most of the sponges are radially symmetrical.
iv) Platyhelminthes have a tissue level of organization.
How many of the above statements are incorrect?
1) One 2) Two 3) Three 4) None

144. A man of blood group A marries a woman of blood group AB. Which type of progeny indicates that man is heterozygous?
1) O 2) A 3) B 4) AB

145. The essential chemical components of many coenzymes are
1) Nculeic acid 2) Carbohydrates 3) Vitamins 4) Proteins

146. Biological organization starts with
1) Cellular level 2) Organismic level
3) Submicrospic molecular level 4) Tissue level

147. Sea fur belongs to phylum A. members of such phylum have:
1) Bilateral symmetry 2) Blind sac body plan
3) Metamerism 4) Triploblastic nature

148. Which of the following statement is incorrect about phylum hemichordate.
1) Excretion by proboscis glands 2) Respiration by probosicis glands
3) Monoecious
4) Have a rudimentary structure in the collar region called stomochord

149. Cytoskeleton is made up of
1) Callure deposits 2) Cellulosic microfibrills 3) Proteinaceous filaments
4) Calcium carbonate granules

150. Callus can form plantiets by altering the concentration of
1) Phytohormones 2) Amino sugars 3) vitamins 4) Sugars

151. Which of the following is correct with respect to bioforitfied food?
1) Wheat variety, Atals 66, hving a high lysine and tryptophan content.
2) Vitamin C enriched crop are bitter gourd, bathau, mustard, tomato
3) Vitamin A enriched carrots, spinach, Fench and garden peas
4) Iron and calcium enriched broad and lablab

152. How many of the following structures/organs belong to the male reproductive system of a cockroach?
[Utricular gland, spermatheca, oothecal chamber, Phallic gland, seminal vesicles]
1) None 2) One 3) Two 4) Three

153. Dense connective tissue can be observed at all of the following locations, except
1) Ligament 2) Tendon 3) beneath the skin 4) Skin

154. Select the incorrect statement
1) Algin is obtained from Algae.
2) Cyanobacteria form mycorrhizae which helps in the absorption of phosphate
3) Salvinia, Selagiella and Azolla show heterospory.
4) The genome of TMV is RNA

155. Conducting part of the tertiary bronchi and bronchioles end up in
1) Segmental bronchi
2) Segmental bronchiole
3) Respiratory bronchioles
4) Terminal bronchiole

156. The process of conversion of organic nitrogen from dead material to ammonia is known as
1) Nitrification 2) Decomposition 3) Denitrification 4) Ammonification

157. Which of the following in incorrectly matched?
1) ABO Blood group of Humans – Multiple allelism.
2) Skin Colour in human – Multiple allelism
3) Flower colour in Mirabilis – Incomplete dominance
4) Phenylketonuria – Pleiotropisim

158. Vasa recta is associated with
1) Most of cortical nephrons 2) Few of cortical nephrons only
3) Juxta medullary nephrons 4) Urinary bladder

159. Rubisco enzyme can act both as carboxylase and as oxygenase. In C_4 cycle it functions are
1) Oxygenase only 2) Carboxylase only
3) Mainly carboxylase activity minimizing oxygenase
4) Oxygenase but sometimes as carboxylase

160. Which of the following is not a post pollinating development?
1) Formation of callose plugs pollen tube
2) Division of pollen cell into tube cell and generative cell
3) Secretion of pectinase and other hydrolytic enzyme
4) Swelling of tube cell and formation of pollen tube

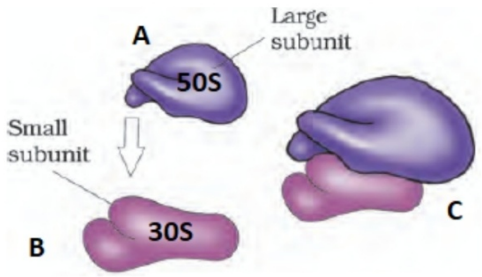
161. Which of the following is not the example of synovial joint?
1) between humerus and pectoral girdle
2) between atals and axis
3) between carpal and metacarpal of thumb
4) Betweeen the adjacent vertebrae

162. How many of the given statements are correct?
A. Hypotahlamus is the centre for eating and drinking
B. Corpus callosum is made up of nerve fibres
C. ADH is synthesized by the posterior pituitary.
D. Balancing by semicircular canals is doen by the macula.
1) One 2) Two 3) Three 4) All

163. According to the taxonomic hierarchy, which of the following statements are correct?
1) Fells and Canis are placed under same family
2) Potato and brinjal belong to the same genus.
3) Classes of plants with few similar characters are assigned to higher category called order.
4) Panther and Felis domestica are placed in different families.

164. Dikaryon formation is characteristics of
1) Ascomycetes and Basidiomycetes
2) Phycomycetes and Ascomycetes
3) Basidiomycetes and Zygomycetes
4) Phycomycetes and Deuteromycetes

165. Analyze the diagram given below, and select the correct option regarding part labeled as C.



1) 70S subunit formed during eukaryotic translation
2) 70S subunit formed during prokaryotic translation
3) 80S subunit formed during prokaryotic translation
4) 80S subunit formed during eukaryotic translation

166. The lining of each seminiferous tubule is made up of 2 types of cells – A and B. 'A' cells undergo meiosis and result in sperm formation. 'B' cells secrete
1) Testosterone 2) Estrogen 3) FSH 4) None of these

167. The longest part of the fallopian tube is
1) Isthmus 2) Fimbriated end 3) Ampulla 4) Uterine part of Fallopian tube

168. The mRNA consisting of 282 nucleotides can produce a polypeptide chain of
1) 282 amino acids 2) 120 amino acids 3) 93 amino acids 4) 94 amino acids

169. "Every species has a right to live". What kind of value implies the conservation of biodiversity?
1) Narrowly utilitarian 2) broadly utilitarian 3) Aesthetic 4) Ethical

170. In a complete study of grassland ecosystem and pond ecosystem, it may be observed that
1) The abiotic components are almost similar.
2) The biotic components are almost similar
3) Both biotic and abiotic component are different
4) Primary and secondary consumers are similar

171. Which of the statement is not applicable to mutations?
1) These are discontinuous variations
2) Usually recessive
3) Usually harmful
4) Predictable

172. Which of the following set shows convergent evolution?
1) Anteater and Numbat 2) Lemur and Bobact
3) Spotted Cuscus and Wolf 4) Mole and flying Phalanger

173. In eukaryotic transcription, heteronuclear RNA (hnRNA) is transcribed by
1) RNA polymerase I 2) RNA polymerase II
3) RNA polymerase III 4) All of these

174. Vertical distribution of different species occupying different levels is called
1) Stratification 2) Eutrophication 3) Productivity 4) Biodiversity

175. Crossing over occurs between
1) Two different genomes 2) Homologous chromosome
3) Sister chromatid 4) Non homologous chromosome

176. Select the set of opioids
1) Morphoine and hashishs 2) Codeine and charas
3) herion and marijuana 4) Morphine and heroin

177. Blood and bone marrow tests are mainly done for analysis of
1) leukemia 2) Gastric carcinoma 3) Skin carcinoma 4) brain tumour

178. When both allelse of a pair are fully expressed in heterozygotes, they are called
1) Lethals 2) Codominants 3) Incomplete dominants 4) Recessive allele

179. The method of breeding, in which superior males of one breed are mated with superior females of another breed is called
1) Inbreeding 2) Inter – specific hybridization 3) Outcrossing 4) Cross Breeding

180. Which layer of uterus exhibits strong contraction during parturition?
1) Perimetrium 2) Myometrium 3) Endometrium 4) Mesovarium

NTA NEET MOCK TEST – 15 KEY & SOLUTIONS

KEY

PHYSICS

1-10	4	2	3	4	1	4	3	3	3	3
11-20	2	2	1	4	3	2	2	1	3	3
21-30	4	2	3	2	2	4	4	3	2	3
31-40	3	4	3	1	2	1	2	3	1	3
41-45	1	2	1	3	4					

CHEMISTRY

46-55	4	3	2	3	2	3	1	2	1	2
56-65	3	3	4	2	4	3	1	3	3	1
66-75	2	1	3	4	1	2	4	1	3	1
76-85	1	3	4	2	4	4	3	3	4	4
86-90	1	1	3	2	4					

BIOLOGY

91-100	4	3	2	4	4	3	3	1	2	2
101-110	4	2	2	4	3	1	2	1	3	3
111-120	4	2	3	4	2	1	2	4	4	2
121-130	4	1	2	2	2	1	1	2	2	2
131-140	1	3	4	2	4	4	2	4	1	4
141-150	4	3	2	3	3	3	2	2	3	1
151-160	2	4	3	2	3	4	2	3	3	2
161-170	4	3	2	1	2	1	1	3	4	3
171-180	4	1	2	1	2	4	1	2	4	2

SOLUTIONS

PHYSICS

1. $e = M\left|\frac{di}{dt}\right|,\ e_{\max} = L(20)(100\pi)$

$10\pi = 2000L\pi \Rightarrow L = 5mH$

2. $e = \vec{i}.\left(\bar{v}\times\bar{B}\right) = 25$

3. $V = 240V,\ I = 0.7A,\ P_{in} = 240\times 0.7 = 168\omega$

Pointput = $140\omega,\ n = \frac{output}{input}\times 100 = 83.3\%$

4. $V = L\frac{di}{dt} = (0.1)20(100\pi)\cos\frac{\pi}{3} = 100\pi = 314V$

5. $I = I_0 \sin \omega t,\ \frac{I_0}{\sqrt{2}} = \sin \omega t \Rightarrow t = 2.5ms$

6. $\frac{1}{f} = \frac{1}{v} - \frac{1}{u},\ u = \frac{50}{3}$

7. $\frac{(A_1 + A_2)^2}{(A_1 - A_2)^2} = \frac{9}{1} \qquad \frac{A_1}{A_2} = \frac{2}{1}$

8. $\frac{1}{F} = (\mu - 1)\frac{1}{R},\ \frac{1}{f} = -\frac{2}{f_L} + \frac{1}{f_m} \qquad f_m = 0$

$\frac{1}{f^1} = -2\left[\frac{1}{f}\right] \quad f^1 = \frac{-F}{2}$ concave mirror

9. $I = \frac{10}{10^3} - \frac{6}{10^3} = 4mA$

10. $x = 1, y = 0,\ (\bar{x} + y) + (x\bar{y}) = R$

$R = x\bar{x}\bar{y} + x\bar{y} = x\bar{y}$

11. $E = -T.E,\ \lambda = \frac{12.27}{\sqrt{y}} A^0$

12. $\frac{hc}{\lambda_3} = \frac{hc}{\lambda_1} + \frac{hc}{\lambda 2}$

13. $N = mg + \frac{mv^2}{r}$

14. $v =$ constant, a = 0

15. Sliding friction is greater than rolling friction.

16. $\bar{A} + \bar{B} = 10\hat{i} + 5\hat{j}$

$|\bar{A} + \bar{B}| = 5\sqrt{5}, Tan^{-1}\left(\frac{1}{2}\right)$

17. Error $\propto \frac{1}{Observation}$

$\frac{E_1}{E_2} = \frac{O_2}{O_1} \Rightarrow E_2 = \frac{E_1}{4}$

18. $50 \times 80 + 50(\theta) = 50(100 - \theta)$

$\theta = 100^0 C$

19. Because Plank's law explains the distribution of energy correctly at low temperature as well as at high temperature

20. No flow of heat by convextion in vacuum. As convection requires medium particle to propogate.

21. continuity equation

22. $F = m\left(\frac{O - u^2}{2S}\right)$

23. $T_2 = \frac{V_2}{V_1} T_1$

24. In vapour to liquid phase transition, heat is liberated

25. $f = \frac{1}{T} = \frac{1}{0.2}$

26. $v = f\lambda$

27. $\frac{A}{2} = A\sin\omega t$

28. $H = KA\frac{\Delta\theta}{L}, \frac{\Delta\theta_1}{L_1} = \frac{\Delta\theta_2}{L_2} = 50$

29. $Q = \Delta U + w$ AAJ KA TOPPER

30. $V \propto T \quad \frac{V}{300} = \frac{3V}{T_2}, T_2 = 900K$

31. When a copper ball is heated, its size increases.

As, volume $\propto (radius)^3$ *and area* $\times (radius)^2$

So percentage increase will be largest in its volume.

32. w is constant

33. $I_4 = \frac{1}{2}mr^2 + mr^2 = \frac{3}{2}mr^2$

34. $v_2 - v_1 = u_1 - u_2$

$mu_1 + mu_2 = m_1v_1 + m_2v_2$

By solving $v_1 = u_2, v_2 = u_1$

35. $P_i = P_f$

$$\frac{v_0}{2}\hat{i} = -\frac{mv_0}{2}\hat{i} + m\frac{3v_0}{2}\hat{j} + m\vec{v}$$

$$v = \frac{5v_0}{2}$$

36. $N_1 = \frac{w}{4}$

$$N_2 = w - \frac{w}{4} = \frac{3w}{4}$$

$$N_1\frac{1}{2} = N_2\left(\frac{1}{2} - x\right)$$

$$x = \frac{L}{3}$$

37. Work done along the y – axis is due to force along y – axis which will cause displacement along the y – axis .

Therefore, F = 15n and displacement is 10 m along y – axis.

$$\Rightarrow W = 15\times 10 = 150J$$

38. $\frac{f_1}{f_2} = \frac{A_1}{A_2} = \frac{v_1^2}{r_2^2} = \frac{1}{4}$

39. $mS_A(30-\theta) = mS_B(\theta - 20)$

40. $y = x\tan\theta - \frac{gx^2}{2u^2\cos^2\theta}$

41. $Fh = \frac{2}{5}mR^2\alpha$

$$h = \frac{2R}{5}, J = mv$$

42. $w = \int_{(0,0)}^{(1,1)} \overline{F}.d\vec{x}$

$$d\vec{s} = dx\vec{i} + dy\vec{j} + dz\vec{k}$$

$$w = \int_{(0,0)}^{(1,1)}\left(x^2dy + ydx\right)$$

$$= \int_{(0,0)}^{(1,1)}\left(y^2dy + xdx\right)$$

$$w = \frac{y^3}{3} + \frac{x^2}{2} = \frac{5}{6}J$$

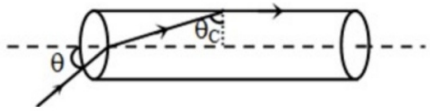
43. $F = Kx$

$$\frac{q^2}{2A\varepsilon_0 K} = x$$

44. Max expansion takes place only when both the rings move with the same speed by work energy theorem

$$\frac{1}{2}Kx_0^2 = \frac{1}{2}\mu v_0^2 \quad x_m = \sqrt{\frac{\mu}{k}}v_0$$

45.



From Snell's law,
$\mu_{air}\sin\theta = \mu_{cylider}\sin\ (90^\circ - \theta_C)$
$\Rightarrow 1\times\sin\theta = \frac{2}{\sqrt{3}} \times \cos\theta_C$
But, $\sin\theta_C = \frac{1}{\mu_{cylinder}} = \frac{\sqrt{3}}{2}$
Therefore $\cos\theta_C = \frac{1}{2}$
$\Rightarrow \sin\theta = \frac{2}{\sqrt{3}} \cdot \frac{1}{2} = \frac{1}{\sqrt{3}}$
$\Rightarrow \theta = \sin^{-1}\frac{1}{\sqrt{3}}$

CHEMISTRY

AAJ KA TOPPER

46. Phenol undergoes Kolbe's Schmidt reaction is presence of $CO_2 / NaOH$ to form salcyclic acid, which on further reacton with acetyl chloride produces aspirin.

47. Ambident ligands have more than one donor sites (atoms), but only are atom can donate lane pair at a time.

Eg: $\overset{\Theta}{C}N, \overset{\Theta}{N}O_2$

48. $A \rightarrow B,\ q = 5J,\ W = -8J$

$\Delta U = q + W = 5 - 8 = -3J$

$B \rightarrow A,\ q = -3J,\ W = ?$

$\Delta U = q + W \qquad \Delta U = +3J,$

$3 = -3 + W$

$W = +6J$

49. No two electrons in an atom can have same set of quantum numbers (or) An orbital can accommodate a maximum of two electrons.

50. $K_{sp} = \left[Zn^{2+}\right]\left[S^{2-}\right] K_{eq} = \dfrac{\left[H^+\right]^2\left[S^{2-}\right]}{\left[H_2S\right]}$

$10^{-21} = 0.01\left[S^{2-}\right]10^{-20} = \dfrac{\left[H^+\right]^2 10^{-19}}{\left[0.1\right]}$

$S^{2-} = 10^{-19}\, H^+ = 10^{-1}$

51. Esters are named as alkyl alkanoate

Alkanoate is from acid.

Alkyl group is from alcohol

$R - COO - R^1$

$R \rightarrow acids, \quad R^1 \rightarrow alochol$

52. $2CO_2 \rightleftarrows 2CO + O_2$

0.6 atm 0.4 atm 0.2 atm

$K_p = \dfrac{P_{C_0}{}^2 \times P_{O_2}}{P_{C_{O_2}}{}^2} = \dfrac{0.4 \times 0.4 \times 0.2}{0.6 \times 0.6} = 0.088$

53. $2H_2O \rightarrow 2H_2 + O_2$

2: 1

$5L\ of\ O_2 \rightarrow Rs\ X$

$10L\ of\ H_2 \rightarrow Rs\ X$

$5L\ of\ H_2 \rightarrow Rs\ \dfrac{X}{2}$

54. Packing efficiency of FCC (or) CCP = 74%

55. Faraday's II^{nd} law

$\dfrac{W_{Cu}}{W_{H_2}} = \dfrac{E_{cu}}{E_{H_2}}$

$\dfrac{W_{C_u}}{0.504} = \dfrac{63.5/2}{1}$

$W_{Cu} = 15.9g$

56. It is Baeyer – Villiger oxidation of ketone. In case of unsymmetrical ketenes, the preference of insertion of oxygen atom between carboxyl carbon and akyl group in decreasing order as follows.

$H > 3^0\,alkyl > 2^0\,alkyl > C_6H_5 > CH_3$

57. Fluorospor (or) cryolite reduce melting point and increase conductivity.

58. $r_1 = K\left[SO_2\right]^2\left[O_2\right] \rightarrow (1)$

$r_2 = K\left[\frac{SO_2}{2}\right]^2\left[\frac{O_2}{2}\right] \rightarrow (2)$

$\frac{(1)}{(2)} \quad \frac{r_1}{r_2} = \frac{8}{1}$

59. because of small size of Fluorine and compact 2p – subshell where inter electronic repulsions are more.

60. In cycle alkenes, Cis is more stable than trans. In $CH_2F - CH_2F$ Gauche is more stable than anti due to ganche effect.

61. Information based

62. FeS_2 looks like gold

63. $CH_3 - \overset{Cl}{\underset{|}{C}}H - CH_3 + C_2H_5ONa^+ \rightarrow CH_3 - CH = CH_2$

2^0 halides prefer elimination than substitution due to steric hindrance. So, alkene is the major product.

64. In chemisorptions, extent of adsorption first increases with temp due to supply of energy of activation and then decreases with temperature.

65. Borax is represented as $Na_2\left[B_4O_5(OH)_4\right].8H_2O$

66. It donot possess plane of symmetry AAJ KA TOPPER

67. $PV = nRT$

Before dent. Vol of gas = $\frac{nRT}{P} = \frac{100 \times 0.082 \times 300}{40 \times 2}$ =30.75L

After dent. Vol. of gas = $\frac{nRT}{P} = \frac{90 \times 0.082 \times 300}{40 \times 2}$ = 27.7 L

68. Amphoteric species can behave like acids as well as bass.

i.e., can donate and accept H^+ ion.

69. Rate of S_N reactions depends an nature of leaving group.

Weak conjugate bases are good leaving groups.

70. Information based ortho hydrogen $\rightarrow$proton of each H – atom. Spin in same direction.

Para hydrogen proton of $\rightarrow$proton of each H – atoms spin in opposite direction

71. $HNO_3 + 3HCl \rightarrow NoCl + 2H_2O + 2Cl$

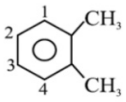
$Pt + 4Cl \rightarrow PtCl_4$

$PtCl_4 + 2HCl \rightarrow H_2PtCl_6$ chloroplatinic acid.

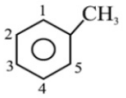
72. $Al_2S_3 + H_2O \rightarrow Al(OH)_3 + H_2S$

73.

All (carbon are secondary)



(4 carbon are secondary)



(5 carbon are secondary)

Secondary carbons are those which attached with two other carbon atoms.

74. Reactivity depends on resonance effect, Hyper – conjugation which activate benzene ring towards electrophilic attack.

75. CIP (Cahn – Ingold – Prelog) sequence depends on atomic number (or) atomic mass.

76. (i) $H_2^{2+} \Rightarrow 'O'$ electrons

$He_2 \Rightarrow B.O = \frac{2-2}{2} = 0$

Both have zero bond order and hence donot exist.

77. Primary amines with nitrous acid undergo diazotization producing diazonkium salt which further dissocates to alcohol and N_2

78. In non – stoichiometric defects, same ions leave their lattice sites creating vacancies, thus lowers the density of crystal

79. $P = X_x P_x^0 + X_y P_y^0$

$550 = \frac{1}{4} \times P_x^0 + \frac{3}{4} \times P_y^0$

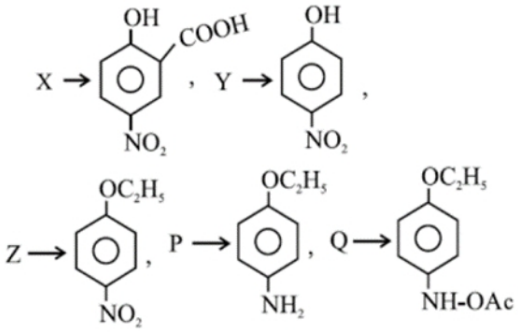
$560 = \frac{1}{4} \times P_x^0 + \frac{4}{5} . P_y^0$

As solving $P_x^0 = 400, P_y^0 = 600$

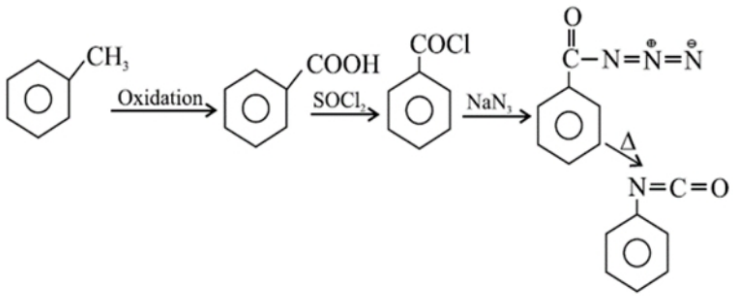
80. With cold & dil NaOH $\rightarrow$ NaOCl

With hot & conc. $NaOH \rightarrow NaClO_3$

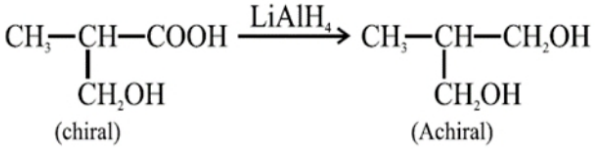
81.



82.



83.

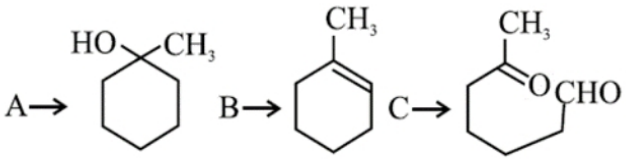


84. Ozone is present in stratosphere

85. It is salt of H_2O_2 which is in the form of O_2^{2-}, diamagnetic in nature and oxidizes Cr^{3+} to chromate ion. $Na_2O_2 + Cr^{+3} \rightarrow CrO_4^{2-} + H_2O$

86. These two are non – superimposable mirror images of each other, so they are enatiomers

87.



88. Poly (β - hyrorybutyrate - β - hydroxyvalerate) is biodegradable and non – polyamtextde polymer

89. $d \propto \frac{P}{T}$ $d \uparrow$ $P \uparrow$ $T \downarrow$

90. $NaCl + Ag^{+} \rightarrow AgCl \downarrow$

$4I^{-} + 2Cu^{+2} \rightarrow Cu_2I_2 \downarrow + I_2$

$Ni^{+2} + Na_2S \rightarrow NiS \downarrow + 2Na^{+}$

BIOLOGY

91. The vegetative cell and Generative cell

92. hCG, hPL, relaxin are produced only during pregnancy. Estrogen, progesterone and cortisole are secreted during normal days also.

93. Copper releasing IUDs have a local anti fertility effect by bringing about release of toxic cytokines. They also suppress sperm motility & ability to fertilize the ovum.

94. MTPs are allowed, if the pregnancy is the result of rape

95. If the % of recombination is les than 50%, then the genes are said to be linked if two genes are present close on the chromosomal linkage as a result frequency of crossing over between the genes decreases. As a result number f parental type is more than the recombinant type.

96. Histones are rich in the basic amino acid residuce lysine and arginine and hence are positivity charged

97. In Lac operon, the active repressor can be inactivated by inducer, like lactose and allolactose only.

98. Some times the change in allele frequency is different in new sample of population. This original drifted population becomes founder & the effect is called founder effect.

99. i) Typhoid & Amoebiasis are transmitted through contaminated food & water.

ii) Penumonia & Common cold are air borne diseases

iii) Ring worm infection is by using towels, clothes of infected person

iv) Dengue & Chikengunya is by mosquito bite.

100. Anti venum provides passive immunity

101. Somatic hybridization is the process by which two somatic cells are fused to form a hybrid cell.

102. 5 main steps involved in plant breeding

103. i) Mating of more closely related individuals with in the same breed for 4 – 6 generation of Animals is inbreeding

ii) Crossing of superior males of one breed with superior female of another breed is outcrossing

iii) Male & Female of different species is inter specific hybridization.

104. Monascus purpurens is a yeast used commercially in the production of blood cholesterol lowering agent.

105. Resistant to the action of restriction enzyme

106. The primers used should be complementary to 3' end of template DNA

107. Cry IAc and Cry IIAb control the cotton bollworms, cry IAb controls corn borer

108. Atmosphere

109. He has taken a large sampling size

110. Species to kingdom, the number of common characters goes on decreasing

111. Rhodospirillum

112. Bacteriophage is smaller than TMV

113. Mollusca is the second largest phylum

114. Circulatory system in platyhelminthes is absent echinoderms are unisexual

115. Indigofera, luin, trifolium, sesbania

116. Annual rings are formed by the activity of cambium

117. One pair in 6^{th} abdominal seg.

118. Periplaneta has open blood vascular system. Blood vessels are poorly developed. The viscesal organs are located in Haemocoel. Haemocoel is filled with a fluid, which is composed of plasma and haemocytes.

119. Axoneme is found in cilia and flagella

120. In competitive inhibition, an inhibitor that are resembles the normal substrate bind to the enzyme

121. DNA content reduced half during meiosis

122. Different substance move independently along their concentration gradient in mass flow

123. $8e^{-} + 8H^{+}$

124. $PGA \rightarrow PGAL$

125. $Cyt\ b, c, a, a_3$

126. Respiratory climactic

127. Maranmus is PEM that affects the infants.

128. Moist cuticle is respiratory organ of earthworm

129. QRS complex represents ventricular depolarization

130. Amount of urine released by humans in a day is 1 – 1.5 lit, slightly acidic pH with 6.0 having 25 – 30 gms of urea.

131. Midbrain is located between. Thalamus /hypothalamus of fore brain and pans varoli of hind brain.

132. Thymosin plays a role in both cell mediated & humoral immunity by producing ntibodies

133. Devil fish = Octopus = Mollusca phylum

King Cobra = Reptilia class = Chordata phylum

Chiton = Mollusca phylum

134. In tripalmitin (fat) the RQ is about 0.7

135. Cork cambium + cork + secondary cortex = Periderm

136. Phenylketonuria is an example for pleiotrophy is also caused due to single gene mutation.

137. Pairing of homologous chromosome and recombination between them

138. Asterias. Its larva has bilateral symmetry & Adult Asterias has pentaradial symmetry.

139. Hydrophytes that are fully submerged in water have no somata eg. Algae

140. Zygote undergoes cleavage to form morula, which continues to divide to form blastocyst. Blasotcyst gets implanted to wall of uteus.

141. Micoplasma 0.3 μm, bacteria 3 to 5 μm

RBC – 7.0 μm

142. Protista and plantae AAJ KA TOPPER

143. Most of sponges are asymmetrical. Platyhelminthes have organ level of organization.

144.

	I^A	i^O
I^A	$I^A I^A$	$I^A i^O$
I^B	$I^A I^B$	$I^B i^O$

145. Vitamins

146. Submicroscopic molecular level

147. Seafur is Obelia, the members of this phylum has blind sac, body plan.

148. Hemichordates respiration takes place through gills & they are unisexual (dioecious)

149. Proteinaceous filamints

150. Phytohermones (Auxin and Cytokinine)

151. IARI (New Delhi) released several biofortified crops

152. Utriculargland, Phallicgland, seminal vesicles

153. Beneath the skin loose connective tissue, Adipose tissue is present

154. Mycorhiza literally means fungus – root and describes the mutually beneficial relationship.

155. Tertiary bronchi endup with Respiratory bronchiole

156. Ammonification

157. Skin colour in humans is polygenetic inheritance

158. Vasa recta is associated with juxta medullary nephrons

159. Mainly carboxylase activity, minimizing oxygenase

160. Tube cell (vegetative cell) and generative cell

161. Joint between Adjacent vertebrae is fibrous joint

162. ADH is not synthesized by posterior pituitary it just releases the hormone which is synthesized by Hypothalamus

163. Potato and Brinjal not only belongs to the same family but also same genus.

164. Ascomycetes and Basidiomycetes

165. Eukaryotic ribosome are 80s (60s, 40s) prokaryotic ribosomes are 70s(50s, 30s)

166. Seminferous tubuuels are lined by A cell (Sperm mother cells) which produce sperms & B cell (leydig cells) secrete testosterone.

167. Isthamus is longest part

168. Each codon is a triplet in nature, therefore in the given chain of mRNA there must be total of 94 codons (282/3). But, if we consider the last codon as a stop codon, 80 93 amino acids are formed.

169. Every species has a right to live is ethical value

170. Both biotic and abiotic component are different

171. A mutation is a change in a DNA sequence, mutation can result from DNA copying mistakes made during cell division, exposure to ionizing radiation. (predictable)

172. Anteater & Numbat are set showing convergent evolution

173. Polymerase II

174. Stratification: the vertical distribution of different species accupying different levels in an ecosystem

175. Crossing over occurs between Homolgous chromosome during meiosis

176. Morphine & heroin are opioids

177. Blood and bone marrow analysis are done for detecting leukemia (abnormal ↑ of WBC)

178. Co – dominance occurs when multiple alleles are expressed at the same time an example of co – dominance is blood group type.

179. Produce (an animal or plant) by mating or hybridizing two different species, breeds or varieties is called cross breeding

180. Myometrium shows strong uterine contractions at the time of delivery.